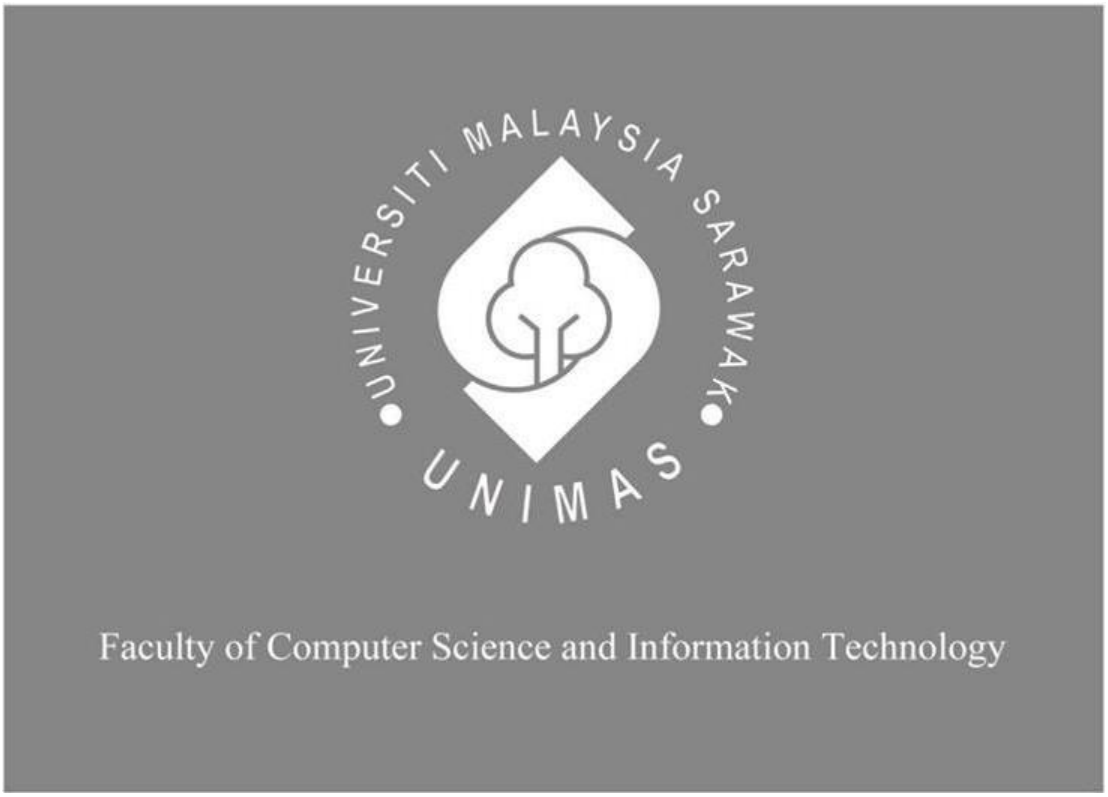

FollowMe: My FCSIT Virtual Tour Guide

Amizanuryanti Bt Ali

Bachelor of Computer Science with Honours (Multimedia Computing)

2019

FollowMe: My FCSIT Virtual Tour Guide

AMIZANURYANTI BT ALI

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ABSTRACT

People nowadays especially university students are more focusing on using devices in their daily life in all aspect such as booking their flight ticket, ordering food, online shopping, taking attendance in class, checking latest news in social media, searching information using Google and finding for direction to reach specific place by using Google maps or Waze. This show how technology today able to ease people life.

Usually for the first timer person at unfamiliar place will face difficulties to find their targeted destination as they do not have any information regarding the direction or specific location on that place. This situation illustrates some of FCSIT students either first year student or student from other faculty and any visitor always face when they try to find particular place around FCSIT. Some people like FCSIT students or visitor might face difficulty in finding a specific lecturer's room, lecture hall, laboratory and also other places around FCSIT as they are not familiar with the surrounding and this cause them unable to find places around FCSIT properly. Commonly students or visitor need to use manual method for wayfinding like ask around or just follow the signage provided to know the correct location and direction that they need to take before reaching their destination.

In this project, a system known as FollowMe: My FCSIT Virtual Tour Guide will be developed to ease the students and also any visitor to find a way around FCSIT by having conversation with the bot. Bot will assist the user by giving an instant response and direction instruction through text based, audio and image to help them reach their targeted destination. This system is developed to improve the manual method which is following the signage provided or asking for help directly from people surrounding when finding a place such as tutorial room in FCSIT. Instead of using manual method it will be more convenience for user to use this system.

ABSTRAK

Pada masa kini, orang ramai terutamanya pelajar universiti lebih tertumpu pada penggunaan peranti dalam kehidupan seharian mereka seperti menempah tiket penerbangan, memesan makanan, membeli-belah dalam talian, mengambil kehadiran di kelas, menyemak berita terkini di media social, mencari maklumat menggunakan Google dan mencari arah untuk menuju ke tempat tertentu dengan menggunakan peta Google atau Waze. Ini menunjukkan bagaimana teknologi kini mampu memudahkan kehidupan manusia.

Kebiasaannya, orang yang baru pertama kali berada di tempat yang tidak dikenali akan menghadapi kesukaran untuk mencari destinasi yang ingin ditujui kerana mereka tidak mempunyai sebarang maklumat mengenai arah atau lokasi tertentu di tempat tersebut. Situasi ini menggambarkan apa yang dihadapi oleh tahun pertama pelajar FCSIT apabila mereka cuba untuk mencari tempat tertentu di dalam FCSIT. Beberapa orang pelajar tahun pertama mungkin menghadapi kesukaran mencari bilik pensyarah, dewan kuliah, makmal dan juga tempat-tempat lain di sekitar FCSIT kerana mereka tidak biasa dengan persekitaran tersebut dan ini menyebabkan mereka tidak dapat mencari tempat di sekitar FCSIT dengan betul. Kebiasaannya pelajar-pelajar FCSIT tahun pertama akan menggunakan kaedah manual untuk mencari arah seperti bertanya atau hanya mengikut papan tanda yang disediakan untuk mengetahui lokasi dan arah yang betul yang perlu diambil untuk sampai ke destinasi.

Dalam projek ini, sebuah sistem yang dikenali sebagai FollowMe: My FCSIT Virtual Tour Guide akan dibangunkan untuk memudahkan pelajar tahun pertama untuk mencari arah di dalam FCSIT dengan berkomunikasi dengan bot. Bot akan membantu pengguna dengan memberikan arahan dengan segera dan arahan tersebut berasaskan teks, audio dan imej untuk membantu mereka menuju ke destinasi sasaran mereka. Sistem ini dibangunkan untuk memperbaiki kaedah manual iaitu mengikuti papan tanda yang disediakan atau meminta bantuan secara langsung dari orang sekitar apabila mencari sesuatu tempat seperti ruang tutorial di FCSIT. Daripada menggunakan kaedah manual ia lebih mudah bagi pengguna untuk menggunakan sistem ini.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Chatbot is a computer program that able to imitate human conversations in its natural format including text or spoken language using artificial intelligence techniques such as Natural Language Processing (NLP), image and video processing, and audio analysis (Bala, Kumar, Hulawale, & Pandita, 2017)**.** It's basically conversation between bot and human user via text based where the bot capable to understand the conversation and able to response user with appropriate answer. Chatbot also known as talkbot, chatterbox, Bot, Instant Messaging bot or Artificial Conversational Entity.

ELIZA was the first chatbot developed by Joseph Weizenbaum on 1966 which was a German Compute**r** scientist and also a Professor at Massachusetts Institute (Ranoliya, Raghuwanshi, & Singh, 2017). It simulated a psychiatrist and rephrased user input using basic (by today's standards) natural language processing techniques (Peters, 2018). Basically, user need to type some statement in natural language so that ELIZA can analyze the statement and generate a response to user. After several years, the sophistication of chatbot began to grow more and more as it was applied in various field. This can be proven through study by Aspect Software Research in 2016 where 44% of the consumers said that they prefer to interact with a chatbot over a human for assistant.

As we can see nowadays, utilization of chatbot among people become more wider as it applied in various area like education, business, customer service, shopping and navigation. For navigation, chatbot will provide information to the user regarding direction and location in certain area during conversation. Considering the fact that people nowadays especially university students are more focusing on using devices in their daily life, FollowMe: My FCSIT Virtual Tour Guide will be a direction assistant for any people either visitor or student itself when they are at FCSIT. It will ease those people that unfamiliar with the place when they are trying to find any specific location on their first trial.

1.2 Problem Statement

Some people either visitor or students itself always facing difficulty in finding a particular place such as specific lecturer's room, lecture hall, laboratory and tutorial room. UNIMAS had provided street view navigation by using Google Maps on UNIMAS Portal but it does not cover indoor navigation for any specific faculty such as FCSIT. Therefore, for those people who are not familiar with the surrounding might unable to find places around FCSIT properly. So,

commonly they will need to ask around in order to know the correct location and direction that they need to take before reaching their destination.

1.3 Scope

The proposed FollowMe: My FCSIT Virtual Tour Guide will be targeted on all people either students itself or any visitor that face difficulties in finding the direction so that it can assist them inside FCSIT. This proposed system will cover selected location inside block B building for example tutorial room 10 at FCSIT. It will ease the user to find location and direction as it will provide information from start until they reach the destination by having conversation with bot. Besides that, the user also will have additional guidance to find a location without fully depending on signage.

1.4 Objectives

The aim to develop FollowMe: My FCSIT Virtual Tour Guide is to assist all people either students or any visitor that have difficulties in finding the direction or location of specific place and facilities around FCSIT. There are three main objectives of this projects.

- To analyze and design indoor virtual navigation system that able to navigate student's direction and location around FCSIT.
- To implement the proposed indoor navigation system for the user by interacting with chatbot.
- To evaluate user satisfaction on using indoor virtual navigation system that able to navigate student's direction and location around FCSIT.

1.5 Brief Methodology

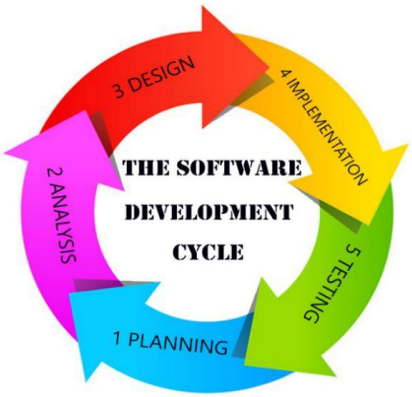

Figure 1. 1: Agile System Development Lifecycle Diagram for FollowMe: My FCSIT Virtual Tour Guide

Agile SDLC was chosen as methodology for development of this proposed system. Agile SDLC Methodology is a set of planning and management technique derived from software development and based on the iterative and incremental execution of activities. According to B.Boehm and R.Turner (2003), agile process is “an iterative approach in which the highest priority will be customer satisfaction as the customer has direct involvement in evaluating the software”. Agile SDLC methodology will go through its own cycle that consist of five phases. The first phase is a planning phase where at this stage aim and goal of the proposed project will be identified.

The second phase is analysis phase. In this stage, information and requirement gathering will be perform in order to explore more details on the problem and understand the system itself. Besides that, able to document all user requirement regarding the system properly.

Next phase is a design phase. In this phase, diagram such as use case diagram, sequence diagram, activity diagram and UML class diagram will be created in order to illustrate flow of the system.

The fourth phase is implementation phase where proposed project will be constructed. All the requirement from user will be transform into coding.

The fifth stage is testing phase where proposed project will be tested. In this step, the functionality of the system will be tested in order to identify any errors. If there is any errors or bugs are detected, it will be fix during this phase. The proposed project will be continuously testing until it meets user satisfaction and all the functionality able to work properly.

1.6 Significant of Project

The significant of FollowMe: My FCSIT Virtual Tour Guide system is to solve students or any visitor problem which is unable to find particular areas around block B of FCSIT as they might confuse or unfamiliar with the places. This proposed system will navigate the users by chat and provide image as a checkpoint to find direction and location for their selected destination around FCSIT. They do not need to look around to find direction sign or asking around anymore as they can refer to FollowMe: My FCSIT Virtual Tour Guide as their assistant. Thus, people that face difficulties in wayfinding before this now able to reach their selected destination on time.

1.7 Project Schedule

Activity	Start Date	End Date	Duration
Final Year Project 1	20/09/2019	12/12/2019	83
Project Proposal	20/09/2019	04/10/2019	18 days
Research on project title	20/09/2019	23/09/2019	4 days
Identify problem statement and objective	24/09/2019	26/09/2019	3 days
Finalize brief proposal	26/09/2019	28/09/2019	4 days
Submission of brief proposal	29/09/2019	29/09/2019	1 day
Amendment of brief proposal	30/09/2019	05/10/2019	6 days
Chapter 1: Introduction	07/10/2019	26/10/2019	15 days
Determine scope and significant of the project	07/10/2019	10/10/2019	4 days
Determine methodology	10/10/2019	13/10/2019	4 days
Finalize full proposal	14/10/2019	17/10/2019	4 days
Amendment of full proposal	17/10/2019	18/10/2019	1 day
Submission of full proposal	19/10/2019	19/10/2019	1 day
Submission of Chapter 1	26/10/2019	26/10/2019	1 day
Chapter 2: Literature Review	27/10/2019	16/11/2019	22 days
Gather information from journal on existing system	27/10/2019	03/11/2019	8 days
Analyze information and documentation	04/11/2019	11/11/2019	8 days
Amendment of Literature Review	11/11/2019	15/11/2019	5 days
Submission of Chapter 2	16/11/2019	16/11/2019	1 day
Chapter 3: Requirement Anlaysis and Design	17/11/2019	12/12/2019	26 days
Collect requirement needed	17/11/2019	20/11/2019	4 days
Create entity relationship diagram and data flow dia	21/11/2019	29/11/2019	9 days
Draw basic design and flow of system	30/11/2019	04/12/2019	5 days
Submission of Chapter 3	05/12/2019	11/12/2019	7 days
Submission of FYP1 Final Report	12/12/2019	12/12/2019	1 day

Figure 1. 2: Project Schedule for FYP 1

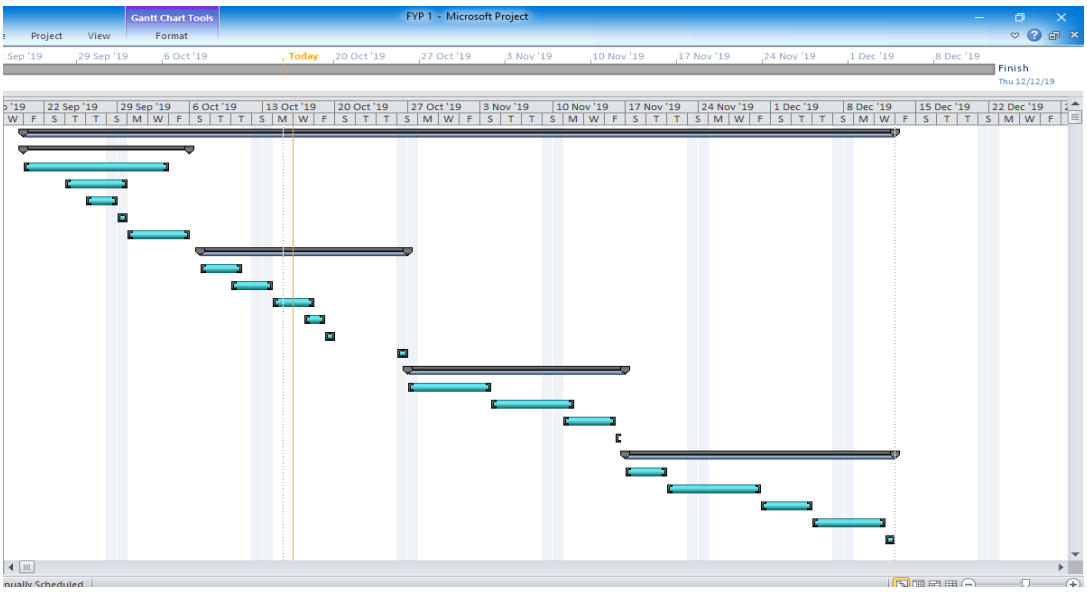

Figure 1. 3: Gantt Chart diagram for FYP 1

1.8 Expected Outcome

A prototype of FollowMe: My FCSIT Virtual Tour Guide that is able to guide a user to reach a correct location by providing them direction information through conversation. Chatbot will respond to each user statement or question in order to collect data from them. This system will be using text based, audio and image in order to ease user finding a way inside block B building of FCSIT. Image provided will act as a signage for the user in order to make sure the user follow the instruction correctly and they are in the right place. This proposed system is able to be direction and location assistant for any people either student itself or any visitor anytime and anywhere inside FCSIT especially block B building.

1.9 Project Outline

This proposed FollowMe: My FCSIT Virtual Tour Guide consist of five chapters which discussed on overall related topic from beginning to end of this project. This chapter include Introduction, Literature Review, Requirement Analysis and Design, Implementation and Testing and finally Conclusion and Future Work. The outline of every chapter will be discussed in the following section below:

Chapter 1: Introduction

In this chapter, it will explain and elaborate the overview regarding the proposed system. This chapter will consist of introduction, problem statement, project scope, objectives, methodology, significant of project, project schedule and expected outcome.

Chapter 2: Literature Review

This chapter will discuss regarding review on the existing system and technique from any related articles, journal, research paper, book and other reliable source to support the statement. Besides that, discuss the comparison between existing system and proposed system in order to improve the features of the proposed system. This chapter also will describe the software and technology required for the project execution.

Chapter 3: Requirement Analysis and Design

In chapter 3, will discuss and explain details about method will be used in this proposed project which is Agile SDLC methodology.

Chapter 4: Implementation and testing

In this chapter, implementation and testing stage will be describe. This chapter will explain on how the system will work. The proposed system will be tested during this phase.

Chapter 5: Conclusion and Future Work

Chapter 5 is the last chapter in this project that will conclude the whole development of proposed project**.** On the other hand, future enhancement of the developed proposed system is being outline.

1.10 Summary

Chapter 1 discuss about the introduction of the proposed system and why it should be developed. This chapter also describe the scope and the significant of the proposed system. Expected outcome for the proposed system also stated in this chapter. Besides that, an overview regarding the methodology that will be used in developing the proposed system included in this chapter 1.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Google Maps and Waze is the most common navigation application that widely used by people nowadays to find direction and location for specific place. Unfortunately, some of this navigation unable to provide indoor routes within the faculty especially FCSIT. There are few other examples of existing system that related with navigation will be discuss in this chapter. This chapter will discuss about the features, strength and limitation of each existing system. Apart from that, comparison between existing system and proposed system will be done at the end of this chapter. Besides that, this chapter also will review tools and technology before selecting suitable one that will be used during project implementation.

2.2 Reviewing existing system

This section will review on four existing system for indoor navigation.

2.2.1 Hospital wayfinding with Cartogram

Cartogram is a Short Message Service (SMS) chatbot that work on smart phone (Clausen, 2013). The purpose of this application is to navigate patients and visitors to find rooms, departments, rest rooms and other destination around hospital easily as finding a way around hospital is typically confusing and hard to navigate due to identical hospital halls and corridors. This application will provide patients and visitors step by step directions and also information about location in order for them to reach their targeted destination. Patients and visitors will receive all direction details through SMS (Refer to Figure 2.1). This application also provides a map image or link for interactive map for clearer information in order to access the specific location (Refer to Figure 2.2). Apart from SMS, Cartogram also provide wayfinding hotline for patients where a real person at the call centre will answers the phone and stays on the line in order to navigate the patient until they reached their destination.

In spite of the fact that this application is very useful for indoor way finding but it has one main limitation where this application required a real person to work 24 hours every day for hotline service. The person who in charge at call centre need to be prepared as the patients or visitors may need their help to reach the destination anytime.

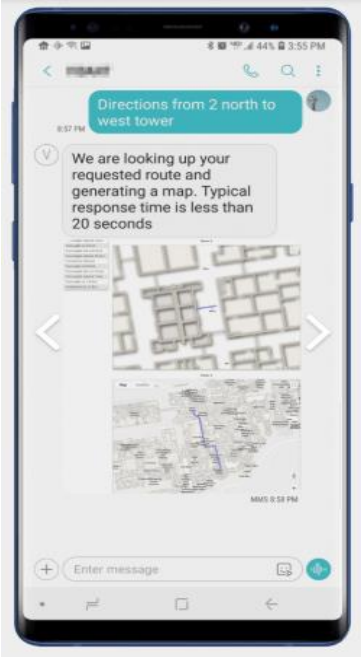

Figure 2. 1: User interact with bot in order to ask for direction information.

Figure 2. 2: Map for navigate the user.

2.2.2 SPREO Intelligent mapping

SPREO intelligent indoor mapping is an indoor navigation platform that can navigate user through chatbot on mobile application (SPREO, 2019). User will have a text-based conversation with SPREO Maps bot where the user asks for the direction guidance in order to reach their targeted destination (Refer to figure 2.3). This application provides indoor mapping, location, wayfinding and intelligence solutions inside the office building. User able to access

elevators, restrooms, meeting room and entrance or exits easily by just chatting with the bot. The bot will instantly answer the user question. Besides that, it also will navigate user to their desired location by viewing their exact location as a blue dot on the map (Refer to figure 2.4). User able to view the building maps, get turn-by-turn directions and also search their points of interest by using SPREO intelligent indoor mapping (Refer to figure 2.5). Apart from that, this application will calculate and provide the user with shortest route from starting point to the destination. This will help user to reach their destination more early than usual route. Thus, it able to save user time and energy. Not only that, user also able to view detailed information for certain place. Lastly, figure 2.6 show that this application also ease user to book the room such as meeting room or conference room. SPREO Maps bot will provide a few choices of meeting room or conference room to the user in order for them able to make the selection based on their preference.

One of the SPREO intelligent indoor mapping limitation is it basically interact with the user just through text and a map in order to guide them the direction or route that they need to follow before reaching their destination.

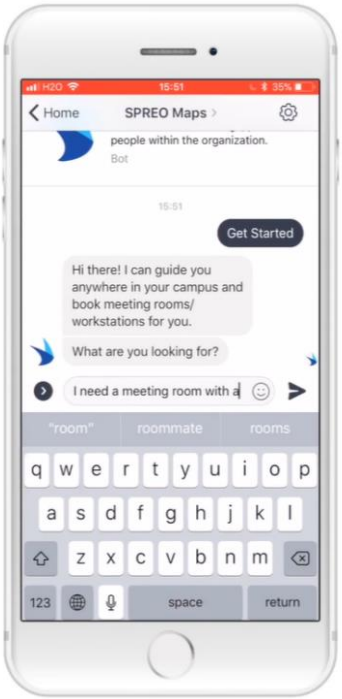

Figure 2. 3: User and SPREO Maps bot having conversation.

Figure 2. 4: Viewing the user exact location as a blue dot on the map.

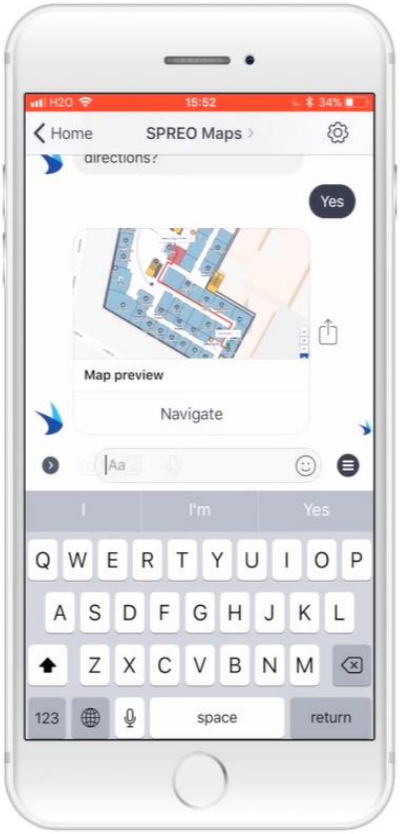

Figure 2. 5: Bot providing a map to navigate the user.

Figure 2. 6: Bot provided user with few choices of room to book.

2.2.3 Lost on Campus

Lost on Campus is Australia biggest free navigation application that provide campus mapping for university students (Students Service Australia, 2018). More than 500,000 students download and use this application. This platform is available on mobile application for both iOS and android. Figure 2.3 shows that Lost on Campus have categorize certain places such as building, lecture theatres, rooms and also labs in order to ease the students to select and search their preferred location. A compass was implemented in this application as it will point the students a right direction when finding their targeted destination such as computer labs, tutorial room, lecture theatre, sport venues and other places around the campus. This application also provides students with detailed information and interactive campus map in order to assist them in finding a best route to reach their destination (Refer to Figure 2.4). It also provides estimated time and distance for students to walk from their current location to their target destination. Besides that, Lost on Campus application offer a point-to-point navigation which it will collect user current location. Students are required to have an internet connection when using this application in order for this application to provide accurate and updated information.